

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A head holding member for guiding a tab portion formed at one end of a head support arm constituting an actuator to an escaping position, and holding the tab portion in the escaping position when an unloading operation of the actuator is performed by an operation stopping command of a disk device;

wherein ~~the shape of~~ the escaping position is formed in the head holding member and comprises:

a head holding plane portion for holding the tab portion;

a load side projecting portion formed on a ~~the~~ loading side of the head holding plane portion; and

an unload side wall face formed on a ~~the~~ unloading side of the head holding ~~plane~~ plane portion,

wherein a load side wall face having an angle smaller than 90° with respect to the head holding plane portion is formed on the loading side of the head holding plane portion, and

wherein the load side wall face forms a face opposed to the head holding plane portion of the load side projecting portion.

2. (Currently Amended) The head holding member of claim 1, wherein the head holding plane portion and the unload side wall face are connected by a curved surface.

3. (Currently Amended) A head holding member for guiding a tab portion formed at one end of a head support arm to an escaping position constituting an actuator, and holding the tab

portion in the escaping position when an unloading operation of the actuator is performed by an operation stopping command of a disk device;

wherein the escaping position is formed in the head holding member and comprises:

a head holding plane portion for holding the tab portion;

a load side projecting portion formed on a loading side of the head holding plane portion;

and

an unload side wall face formed on a unloading side of the head holding plane portion.

~~The head holding member of claim 1,~~

wherein a load side wall face having an angle perpendicular to the head holding plane portion is formed on the loading side of the head holding plane portion, and

wherein a head upper wall face ~~continuing to~~ extends directly from the load side wall face and forms a face opposed to the head holding plane portion, ~~of the load side projecting portion.~~

4. (Currently Amended) The head holding member of claim 3, wherein the head holding plane portion and the load side wall face are connected by a curved surface.

5. (Cancelled)

6. (Currently Amended) A head holding member for guiding a tab portion formed at one end of a head support arm to an escaping position constituting an actuator, and holding the tab portion in the escaping position when an unloading operation of the actuator is performed by an operation stopping command of a disk device;

wherein the escaping position is formed in the head holding member and comprises:
a head holding plane portion for holding the tab portion;
a load side projecting portion formed on a loading side of the head holding plane portion;
and
an unload side wall face formed on a unloading side of the head holding plane portion,
~~The head holding member of claim 1,~~

wherein a ~~third~~ slanting face having an angle greater than 90° with respect to the head holding plane is formed between the head holding plane portion and the unload side wall face,
and

wherein a head moving plane portion parallel to the head holding plane portion ~~are~~ is
formed between the head holding plane portion and the unload side wall face.

7. (Currently Amended) The head holding member of ~~claim 5,~~ claim 1, wherein a head moving slanting face having an angle greater than 90° with respect to the head holding plane portion is formed between the head holding plane portion and the load side wall face, and

wherein a head moving plane portion parallel to the head holding plane portion ~~is~~ are
formed between the head holding plane portion and the load side wall face.

8. (Currently amended) The head holding member of claim 1, wherein the head holding plane portion is formed so as to be parallel to a ~~the~~ recording face of a recording medium of the disk device, or have an acute angle with respect to the recording face of the recording medium.

9. (Currently amended) The head holding member of claim 1, wherein ~~a~~ the width of the head holding plane portion is greater than ~~a~~ the width of the tab portion of the head support arm in a direction perpendicular to ~~a~~ the rotation center of a rotating axis of the actuator.

10. (Currently Amended) A head holding method in a disk device, the disk device including:

a recording medium rotatably arranged around a primary rotating axis;

a head support arm having a head and a tab portion at one end thereof, ~~and able to be rotated~~ the head support arm being capable of rotating around a first rotating axis parallel to the primary rotating axis; ~~axis by~~

a first bearing portion arranged in a position separated from the primary rotating axis, ~~the first bearing portion allowing rotation of the head support arm~~;

a second bearing portion arranged between the head and the first bearing portion, ~~the second bearing portion being capable of rotating~~ portion and able to be rotated around a second rotating axis perpendicular to a center line of the longitudinal direction of the head support arm;

two or more abutting portions located on the second rotating axis and abutting on the head support arm or the second bearing portion;

a leaf spring portion for connecting the head support arm and the second bearing portion;
and

a ~~lamp~~ ramp portion for holding the tab portion at an escaping time of the head support arm, arm;

a head holding plane portion formed in the ramp portion for holding the tab portion in an escaping position;

an unload side wall face formed in the ramp portion, the unload side wall face being formed on an unloading side of the head holding plane portion; and

a load side projecting portion formed in the ramp portion, the load side projecting portion being formed on a loading side of the head holding plane portion for preventing movement of the tab portion from the escaping position to the direction of the recording medium,

~~wherein, when the tab portion is moved to an escaping position to perform an unloading operation of the head support arm by an operation stopping command of the disk device in the ramp portion in which a load side projecting portion formed on the loading side of the head holding plane for preventing the movement of the tab portion from the escaping position to the direction of the recording medium, an unload side wall face formed on the unloading side of the head holding plane, and the head holding plane for holding the tab portion in the escaping position are formed,~~

~~the head holding method comprising:~~ comprising moving the tab portion to the escaping position to perform an unloading operation of the head support arm upon an operation stopping command of the disk device by:

applying forces in a ~~the~~ radial direction of the recording medium and a direction perpendicular to the radial direction ~~and~~ and a biasing force of the leaf spring portion to the head support arm;

moving the head support arm in the radial direction of the recording medium; and

abutting the tab portion on the unload side wall face of the ~~lamp~~ ramp portion and then holding the tab portion in the head holding plane portion as the escaping position of the tab portion by at least the biasing force of the leaf spring portion. ~~portion among the forces applied to the head support arm.~~

11. (Currently Amended) The head holding method of claim 10, ~~wherein, after the unloading operation for moving and holding the tab portion of the head support arm in the head holding plane of the lamp portion is performed by the operation stopping command of the disk device,~~ wherein after said moving the tab portion operation, the tab portion is once operated on the unload side and is operated on the load side by a load command of the disk device.

12. (Currently Amended) The head holding method of claim 10, wherein the head support arm has a voice coil connected to the head support arm through a voice coil holder, and wherein during said moving the tab portion operation, the head support arm swings around the first rotating axis by supplying an electric current from a power supply to the voice coil and operating the voice coil.

13. (Currently Amended) The head holding method of claim 12, wherein the waveform of ~~a driving the~~ electric current applied to the voice coil ~~connected to the head support arm~~ is set to a pulse waveform when the head support arm is operated on the load side.

14. (Currently Amended) A disk device comprising:
a recording medium rotatably arranged around a primary rotating axis;
a head support arm having a head and a tab portion at one end thereof, ~~and able to be rotated-~~ the head support arm being capable of rotating around a first rotating axis parallel to the primary rotating axis; ~~axis by~~

a first bearing portion arranged in a position separated from the primary rotating axis, the first bearing portion allowing rotation of the head support arm;

a second bearing portion arranged between the head and the first bearing portion, the second bearing portion being capable of rotating portion and able to be rotated around a second rotating axis perpendicular to a center line of the longitudinal direction of the head support arm;

two or more abutting portions located on the second rotating axis and abutting on the head support arm or the second bearing portion;

a leaf spring portion for connecting the head support arm and the second bearing portion;
and

a ~~lamp~~ramp portion for holding the tab portion at an escaping time of the head support ~~arm, arm;~~

a head holding plane portion formed in the ramp portion for holding the tab portion in an escaping position;

an unload side wall face formed in the ramp portion, the unload side wall face being formed on an unloading side of the head holding plane portion; and

a load side projecting portion formed in the ramp portion, the load side projecting portion being formed on a loading side of the head holding plane portion for preventing movement of the tab portion from the escaping position to the direction of the recording medium,

—— ~~wherein, when the tab portion is moved to an escaping position in the lamp portion in which a load side projecting portion formed on the loading side of the head holding plane for preventing the movement of the tab portion from the escaping position to the direction of the recording medium, an unload side wall face formed on the unloading side of the head holding plane, and the head holding plane for holding the tab portion in the escaping position are formed;~~

wherein the tab portion is movable to the escaping position to perform an unloading operation of the head support arm upon an operation stopping command of the disk device by:

(i) applying forces in a ~~the~~ radial direction of the recording medium and a direction perpendicular to the radial direction ~~and~~ and a biasing force of the leaf spring portion ~~are applied~~ to the head support arm;

(ii) moving the head support arm ~~is moved~~ in the radial direction of the recording medium; and

(iii) abutting the tab portion ~~abuts~~ on the unload side wall face of the ~~lamp~~ ramp portion and is then held in the head holding plane portion as the escaping position of the tab portion by at least the biasing force of the leaf spring portion, and ~~portion among the forces applied to the head support arm.~~

wherein a slanting face having an angle greater than 90° with respect to the head holding plane portion, and a head moving plane parallel to the head holding plane portion are formed between the head holding plane portion and the unload side wall face.

15. (Currently Amended) The disk device of claim 14, ~~wherein, after the unloading operation for moving and holding the tab portion of the head support arm in the head holding plane of the lamp portion is performed by an operation stopping command of the disk device, the tab portion is once operated on the unload side and is operated on the load side by a load command of the disk device, and is jumped up~~ wherein the head support arm and the ramp portion are configured such that the tab portion can be moved upward from the escaping position without abutting on an ~~the~~ unload side wall face lower portion.

16. (Currently Amended) The disk device of claim 14, wherein the head holding plane portion and the unload side wall face are connected by a curved surface.

17. (Currently Amended) A disk device comprising:

a recording medium rotatably arranged around a primary rotating axis;

a head support arm having a head and a tab portion at one end thereof, the head support arm being capable of rotating around a first rotating axis parallel to the primary rotating axis;

a first bearing portion arranged in a position separated from the primary rotating axis, the first bearing portion allowing rotation of the head support arm;

a second bearing portion arranged between the head and the first bearing portion, the second bearing portion being capable of rotating around a second rotating axis perpendicular to a center line of the longitudinal direction of the head support arm;

two or more abutting portions located on the second rotating axis and abutting on the head support arm or the second bearing portion;

a leaf spring portion for connecting the head support arm and the second bearing portion;

a ramp portion for holding the tab portion at an escaping time of the head support arm;

a head holding plane portion formed in the ramp portion for holding the tab portion in an escaping position;

an unload side wall face formed in the ramp portion, the unload side wall face being formed on an unloading side of the head holding plane portion; and

a load side projecting portion formed in the ramp portion, the load side projecting portion being formed on a loading side of the head holding plane portion for preventing movement of the tab portion from the escaping position to the direction of the recording medium,

wherein the tab portion is movable to the escaping position to perform an unloading operation of the head support arm upon an operation stopping command of the disk device by:

(i) applying forces in a radial direction of the recording medium and a direction perpendicular to the radial direction and a biasing force of the leaf spring portion to the head support arm;

(ii) moving the head support arm in the radial direction of the recording medium; and

(iii) abutting the tab portion on the unload side wall face of the ramp portion and is then held in the head holding plane portion as the escaping position of the tab portion by at least the biasing force of the leaf spring portion. ~~The disk device of claim 14,~~

wherein a load side wall face having an angle perpendicular to the head holding plane portion is formed on the loading side of the head holding plane portion, and

wherein a head upper wall face ~~continuing to~~ extends directly from the load side wall face and forms a face opposed to the head holding plane portion. ~~of the load side projecting portion.~~

18. (Currently Amended) The disk device of claim 17, wherein the head holding plane portion and the load side wall face are connected by a curved surface.

19. (Currently Amended) A disk device comprising:

a recording medium rotatably arranged around a primary rotating axis;

a head support arm having a head and a tab portion at one end thereof, the head support arm being capable of rotating around a first rotating axis parallel to the primary rotating axis;

a first bearing portion arranged in a position separated from the primary rotating axis, the first bearing portion allowing rotation of the head support arm;

a second bearing portion arranged between the head and the first bearing portion, the second bearing portion being capable of rotating around a second rotating axis perpendicular to a center line of the longitudinal direction of the head support arm;

two or more abutting portions located on the second rotating axis and abutting on the head support arm or the second bearing portion;

a leaf spring portion for connecting the head support arm and the second bearing portion;

a ramp portion for holding the tab portion at an escaping time of the head support arm;

a head holding plane portion formed in the ramp portion for holding the tab portion in an escaping position;

an unload side wall face formed in the ramp portion, the unload side wall face being formed on an unloading side of the head holding plane portion; and

a load side projecting portion formed in the ramp portion, the load side projecting portion being formed on a loading side of the head holding plane portion for preventing movement of the tab portion from the escaping position to the direction of the recording medium,

wherein the tab portion is movable to the escaping position to perform an unloading operation of the head support arm upon an operation stopping command of the disk device by:

(i) applying forces in a radial direction of the recording medium and a direction perpendicular to the radial direction and a biasing force of the leaf spring portion to the head support arm;

(ii) moving the head support arm in the radial direction of the recording medium; and

(iii) abutting the tab portion on the unload side wall face of the ramp portion and is then held in the head holding plane portion as the escaping position of the tab portion by at least the biasing force of the leaf spring portion. ~~The disk device of claim 14,~~

wherein a load side wall face having an angle smaller than 90° with respect to the head holding plane portion is formed on the loading side of the head holding plane portion, and

wherein the load side wall face forms a face opposed to the head holding plane portion of the load side projecting portion.

20. (Cancelled)

21. (Currently Amended) A disk device comprising:

a recording medium rotatably arranged around a primary rotating axis;

a head support arm having a head and a tab portion at one end thereof, the head support arm being capable of rotating around a first rotating axis parallel to the primary rotating axis;

a first bearing portion arranged in a position separated from the primary rotating axis, the first bearing portion allowing rotation of the head support arm;

a second bearing portion arranged between the head and the first bearing portion, the second bearing portion being capable of rotating around a second rotating axis perpendicular to a center line of the longitudinal direction of the head support arm;

two or more abutting portions located on the second rotating axis and abutting on the head support arm or the second bearing portion;

a leaf spring portion for connecting the head support arm and the second bearing portion;

a ramp portion for holding the tab portion at an escaping time of the head support arm;

a head holding plane portion formed in the ramp portion for holding the tab portion in an escaping position;

an unload side wall face formed in the ramp portion, the unload side wall face being formed on an unloading side of the head holding plane portion; and

a load side projecting portion formed in the ramp portion, the load side projecting portion being formed on a loading side of the head holding plane portion for preventing movement of the tab portion from the escaping position to the direction of the recording medium,

wherein the tab portion is movable to the escaping position to perform an unloading operation of the head support arm upon an operation stopping command of the disk device by:

(i) applying forces in a radial direction of the recording medium and a direction perpendicular to the radial direction and a biasing force of the leaf spring portion to the head support arm;

(ii) moving the head support arm in the radial direction of the recording medium; and

(iii) abutting the tab portion on the unload side wall face of the ramp portion and is then held in the head holding plane portion as the escaping position of the tab portion by at least the biasing force of the leaf spring portion. ~~The disk device of claim 18;~~

wherein the head holding plane portion and the load side wall face are connected by a curved surface, and

wherein a head moving slanting face having an angle greater than 90° with respect to the head holding plane portion, and a head moving plane parallel to the head holding plane portion are formed between the head holding plane portion and the load side wall face.

22. (Currently amended) The disk device of claim 14, wherein the head holding plane portion is formed so as to be parallel to the recording face of a recording medium of the disk device, or have an acute angle with respect to the recording face.

23. (Currently amended) The disk device of claim 14, wherein the width of the head holding plane portion is greater than the width of the tab portion of the head support arm in a direction perpendicular to the rotation center of a rotating axis of the actuator.

24. (Currently Amended) A disk device comprising:

a recording medium rotatably arranged around a primary rotating axis;

a head support arm having a head and a tab portion at one end thereof, the head support arm being capable of rotating around a first rotating axis parallel to the primary rotating axis;

a voice coil connected to the head support arm;

a first bearing portion arranged in a position separated from the primary rotating axis, the first bearing portion allowing rotation of the head support arm;

a second bearing portion arranged between the head and the first bearing portion, the second bearing portion being capable of rotating around a second rotating axis perpendicular to a center line of the longitudinal direction of the head support arm;

two or more abutting portions located on the second rotating axis and abutting on the head support arm or the second bearing portion;

a leaf spring portion for connecting the head support arm and the second bearing portion;

a ramp portion for holding the tab portion at an escaping time of the head support arm;

a head holding plane portion formed in the ramp portion for holding the tab portion in an escaping position;

an unload side wall face formed in the ramp portion, the unload side wall face being formed on an unloading side of the head holding plane portion; and

a load side projecting portion formed in the ramp portion, the load side projecting portion being formed on a loading side of the head holding plane portion for preventing movement of the tab portion from the escaping position to the direction of the recording medium,

wherein the tab portion is movable to the escaping position to perform an unloading operation of the head support arm upon an operation stopping command of the disk device by:

(i) applying forces in a radial direction of the recording medium and a direction perpendicular to the radial direction and a biasing force of the leaf spring portion to the head support arm;

(ii) moving the head support arm in the radial direction of the recording medium; and

(iii) abutting the tab portion on the unload side wall face of the ramp portion and is then held in the head holding plane portion as the escaping position of the tab portion by at least the biasing force of the leaf spring portion, and ~~The disk device of claim 14,~~

wherein ~~a~~ a the waveform of a driving electric current applied to ~~a~~ a the voice coil ~~connected to the head support arm~~ is set to a pulse waveform when the head support arm is operated on the load side.

25. (Currently Amended) The disk device of claim 14, wherein a bearing in the second bearing portion is a pivot bearing with the pivot ~~as being~~ being an abutting point.

26. (Previously Presented) The disk device of claim 25, wherein the pivot is formed in a conical shape or a pyramidal shape.

27. (Currently Amended) The disk device of claim 14, wherein a bearing in the second bearing portion is a pivot bearing with one of an abutting point formed by an abutting curved surface and an abutting line formed of an abutting ridgeline. ~~one point of an abutting curved surface as an abutting point, or with an abutting ridgeline as an abutting line.~~

28. (Currently Amended) The disk device of claim 14, wherein the head support arm has a voice coil connected to the head support arm through a voice coil holder, and

the head support arm is rotatable ~~swings~~ around the first rotating axis by supplying an electric current from a power supply to the voice coil and operating the voice coil.

29. (Currently Amended) The disk device of claim 14, wherein the disk device is configured such that the tab portion of the head support arm ~~has pressing force for pressing~~ is pressed against the head holding plane portion of the ~~lamp~~ramp portion at a stopping time of the rotation of the recording medium.

30. (Currently Amended) The disk device of claim 14, wherein the head support arm has a voice coil connected to the head support arm through a voice coil holder,

wherein the ~~lamp~~ramp portion is arranged in the vicinity of the outer circumference of the recording medium, and a first magnet is arranged so as to be opposed to the voice coil on the side opposed to the recording medium side with respect to the head support arm.

31. (Currently Amended) The disk device of claim 14, wherein the ~~lamp~~ramp portion is arranged in the vicinity of the rotation center of the recording medium, and a second magnet is arranged so as to be opposed to a ~~the~~ second voice coil on the recording medium side with respect to the head support arm.

32. (Currently Amended) The head holding member of claim 8, wherein ~~the~~ a width of the head holding plane portion is greater than ~~the~~ a width of the tab portion of the head support arm in a direction perpendicular to a ~~the~~ rotation center of a rotating axis of the actuator.

33. (Currently Amended) The disk device of claim 22, wherein a ~~the~~ width of the head holding plane portion is greater than a ~~the~~ width of the tab portion of the head support arm in a direction perpendicular to a ~~the~~ rotation center of a rotating axis of the actuator.

34-35. (Cancelled)